

**REMARKS**

This Amendment is submitted in reply to the Office Action dated December 14, 2004. Applicants respectfully request reconsideration and further examination of the patent application under 37 C.F.R. § 1.111.

Upon entry of the foregoing Amendment, Claims 1-2, 4, 6-16 and 30-35 are pending in the application. The amendments are believed to introduce no new matter, and their entry is respectfully requested. Based on the above amendment and the following remarks, Applicants respectfully request that the Examiner reconsider and withdraw all outstanding objections and rejections.

**Summary of the Examiner's Objections and Rejections**

Claims 8 and 15 were objected to because of the following informalities: a space between  $\leq$  and 1.4 is missing.

Claims 10-16 were rejected under 35 U.S.C. 112 as failing to particularly point out and distinctly claim the subject matter which the Applicants regard as their invention.

Claims 1-2, 4, 6, 8, 10-13 and 15 were rejected under 35 U.S.C. 102(b) as being anticipated by Reichert (US 5,832,165).

Claims 7, 9, 14 and 16 were objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

**Summary of Amendment**

Applicants have cancelled Claims 3, 5 and 17-29 (without prejudice), amended Claims 1, 7-10 and 14-16 and added Claims 30-35 to more particularly define the present invention.

**Affirm Election to Restriction**

Applicants affirm the election that was made without traverse to prosecute the invention of Group 1 including subgroup i (Claims 1-2, 4 and 6-16) which was indicated during a telephone conversation with Mr. Tom Beall on 10/28/04.

**Remarks regarding objected Claims 8 and 15**

Claims 8 and 15 where objected to as having the following informality: a space between " $\leq$ " and "1.4" is missing. Applicants have amended Claims 8 and 15 to include a space between " $\leq$ " and "1.4". As such, Applicant respectfully requests removal of this objection.

### Remarks regarding § 112 rejections

Claims 10-16 were rejected under 35 U.S.C. 112 as failing to particularly point out and distinctly claim the subject matter which the Applicants regard as their invention. In particular, independent Claim 10 was rejected for reciting the term "than in prior art". Applicants have amended independent Claim 10 and removed the term "than in prior art". As such, Applicant respectfully requests removal of this rejection to independent Claim 10 and its associated dependent Claims 11-13.

### Remarks regarding objected Claims

Claims 7, 9, 14 and 16 were objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Applicants have amended Claims 7, 9, 14 and 16 so they are in independent form. In addition, Applicants have amended Claims 7 and 14 to include the following language "said substrate is a thermoplastic material including at least one of a polyvinylidene fluoride, polymethylpentene and blends of polyvinylidene fluoride/polymethylmethacrylate". As such, Applicant respectfully requests allowance of independent Claims 7, 9, 14 and 16 and their associated dependent Claims 8 and 15.

### Remarks regarding § 102(b) rejections

Applicants respectfully submit that amended independent Claims 1 and 10 are patentable over Reichert. The claimed invention as recited in amended independent Claims 1 and 10 follows:

1. A grating-coupled waveguide comprising:  
a substrate;  
a diffraction grating; and  
a waveguide film that has a higher index of refraction than said substrate which is a thermoplastic material that has an index of refraction < 1.5 (emphasis on the distinguishing limitations).
10. A grating-coupled waveguide comprising:  
a substrate;  
a diffraction grating;  
a waveguide film formed above said substrate, wherein said waveguide film has a higher index of refraction than said substrate which is a thermoplastic material that has an index of refraction < 1.5;  
wherein said diffraction grating is either fabricated directly into said substrate or said waveguide film, or located in optical proximity to the said waveguide film, or formed within said waveguide film itself; and  
wherein said substrate has a bottom surface that receives a light beam which interfaces with a waveguide formed by said diffraction grating and said waveguide film and diffracts into a fundamental mode which has an evanescent tail that extends into a sensing region located above said waveguide film (emphasis on the distinguishing limitations).

The teachings of Reichert differ significantly from the present invention as recited in amended independent Claims 1 and 10. The amended independent Claims 1 and 10 each recite a limitation where the substrate is a thermoplastic material that has an index of refraction  $\leq 1.5$ . Reichert fails to teach or suggest where the substrate can be made from a thermoplastic material let alone a thermoplastic material that has an index of refraction  $\leq 1.5$  as claimed in the present invention. Instead, Reichert teaches or suggests a substrate that is made from silicon dioxide ( $\text{SiO}_2$ ), quartz, SiON and magnesium fluoride ( $\text{MgF}_2$ ) (see col. 5, lines 37-65). In addition, Reichert fails to teach the specific types of thermoplastic materials that are recited in the new dependent Claims 30-33. Accordingly, Applicants respectfully submit that the aforementioned substantial differences between Reichert and the amended independent Claims 1 and 10 and their associated dependent Claims 2, 4, 6, 11-13 and 30-33 are indicative of the patentability of the present invention.

In addition Applicants respectfully submit that Reichert fails to disclose the subject matter claimed in the added independent Claim 34. In particular, Reichert fails to teach or disclose a substrate that is a fluoropolymer as highlighted below:

34. A grating-coupled waveguide comprising:  
a substrate;  
a diffraction grating; and  
a waveguide film that has a higher index of refraction than said substrate which is a fluoropolymer that has an index of refraction  $\leq 1.5$  (emphasis on the distinguishing limitations).

As mentioned above, Reichert teaches or suggests a substrate that is made from silicon dioxide ( $\text{SiO}_2$ ), quartz, SiON and magnesium fluoride ( $\text{MgF}_2$ ) (see col. 5, lines 37-65). Accordingly, Applicants respectfully submit that the aforementioned substantial difference between Reichert and the new independent Claim 34 and it's associated dependent Claim 35 are indicative of the patentability of the present invention.

## Conclusion

Applicants respectfully submit that all of the stated grounds of objections and rejections have been properly traversed, accommodated, or rendered moot. Accordingly, Applicants respectfully request reconsideration of all outstanding objection and rejections and allowance of pending Claims 1-2, 4, 6-16 and 30-35.

Enclosed is a USPTO Credit Card Payment Form filled out for \$ 325.00 to cover the fee for one additional independent Claim 34 and five additional dependent Claims 30-33 and 35. If this is incorrect, the Commissioner is authorized to charge any fees which may be required for this paper to Deposit Account No. 50-1481.

Respectfully submitted,



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